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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/745,350	12/21/2000	Ram W. Sabnis	27710-A	2350

7590

08/01/2003

HOVEY, WILLIAMS, TIMMONS & COLLINS
Suite 400
2405 Grand
Kansas City, MO 64108

EXAMINER

BARRECA, NICOLE M

ART UNIT

PAPER NUMBER

1756

DATE MAILED: 08/01/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/745,350

Applicant(s)

SABNIS ET AL.

Examiner

Nicole M. Barreca

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14, 16-26 and 28-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14, 16-26 and 28-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-14, 16-26 and 28-30 are pending in this application.
2. The 35 USC 112, second paragraph rejections have been withdrawn in response to the applicant's amendments and/or remarks.
3. The 35 USC 103 rejections over Eissa in view of Butterfield and Nichols in view of NN73101442 have been withdrawn in view of the applicant's amendments to claims 1 and 19 requiring that the antireflective compound absorbs at least 90% of light of wavelength of about 150-500 nm.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 19, 21-23, 25, 28, 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Haaland (US Patent 5,991,081).

Haaland discloses antireflection coating and coated articles. The layers are formed by plasma enhanced chemical vapor deposition (PECVD). In a preferred embodiment the antireflection film is a layer of polymeric fluorocarbon which have refractive indices generally less than 1.4. One or more molecular precursors are mixed with inert gas flow and excited with electrical power to produce with a plasma. The plasma excites, dissociates and ionizes the precursor, producing reactive fragments that are transported to the surface of the substrate and polymerize to form films. These

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films have refractive properties that depend on the precursors, the deposition conditions and film thickness. Perfluorinated organic compounds such as perfluoroaliphatic, perfluorocycloaliphatic and other fluorocarbon compounds. See column 6, line 62 through column 7, line 40 and Table 1. The antireflective layers were tested using wavelengths between 300 and 750 nm (col.5, 15-16). The thickness of the antireflection layer is chosen and can be controlled to achieve AR properties. A typical change in reflectance with the thickness of a single layer antireflection layer is shown in figure 5. The reflectance of the 387 nm layer is $\frac{3}{4}$ wave at 516 nm and is reduced to a value equal to that for $\frac{1}{4}$ wave layer (125 nm) at 500 nm (col.7, 41-55).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-14, 16-26, 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 8-064492 (English translation from JPO website).

JP 8-064492 discloses a pattern forming method using an antireflection film. The antireflective film 3 is deposited using a vapor deposition film of nonmetallic phthalocyanine. The antireflective film absorbs light in a wavelength range of 140-450 nm. A photoresist pattern 4a is formed on the film by exposure and development, the surface of film 3a is removed by O₂ plasma RIE and base material 2 is etched. The photoresist and antireflective layers are removed by a peeling liquid or ashing

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(abstract). The antireflective film consists of an organic compound and has an optical absorption in the 150-450 nm range. The organic compounds comprise cyclic moieties connected with linkage groups. See formula 1 and 2 [0030]-[0033]. The antireflective films are formed by vapor growth [0015]. JP 8-064492 teaches that the organic compound of the antireflective layer has an optical absorption in the 150-450 nm wavelength region. While the reference does not explicitly disclose that at least 90% of light in this wavelength region is absorbed, one of ordinary skill in the art would have to have expected that a majority of light would have to be absorbed in order for the organic compound to be useful as an antireflective film in a photolithographical patterning process. The reference is silent on some specific process conditions and does not disclose that the strain energy is at least about 10 kcal/mol, that the k value is at least 0.1 of a predetermined wavelength, that the percent conformality of the substrate surface is at least about 85%, that the vapor formation is carried out at 35-160 °C and 2-50 mTorr, that the heating is carried out at 580-700 °C or that the deposition is carried out at about 20-25 °C. It would be within the ordinary skill of one in the art to determine the optimal process conditions in the method JP 8-064492 by routine experimentation because the discovery of an optimum value of a result effective variable is ordinary within the skill of the art, as taught by *In re Boesch* (617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

Response to Arguments

8. Applicant's arguments filed 5/6/03, with respect to claims 19-26, 28-30 over Haaland, have been fully considered but they are not persuasive. The applicant argues

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that Haaland does not teach an antireflective compound comprising a polymer being formed from a monomer having two cyclic moieties joined by linking group. However these claims are product-by-process claims, directed to the precursor substrate which require a structure comprising a substrate and a layer comprising an antireflective compound which absorbs at least 90 % of light at a wavelength from about 150-500 nm, limitations all taught by Haaland. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim ^{is} ~~is~~ unpatentable even though the prior art product was made by a different process. Once the product appearing to be substantially identical is found and a 35 USC 102 or 103 rejection made, the burden shifts to the applicant to show an unobvious difference. See ^{MPEP} ~~MPP~~ 2113.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Linliu "A Novel CVD Polymeric Anti-Reflective Coating (PARC) for DRAM, Flash and Logic Device with 0.1 μm CoSi₂ Gate", discloses the use of a CVD polymeric antireflective coating.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within


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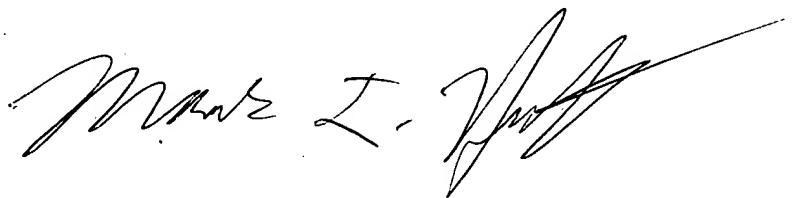
TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole M. Barreca whose telephone number is 703-308-7968. The examiner can normally be reached on Monday-Thursday (8:00 am-6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

nmb 
July 25, 2003



MARK F. HUFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700